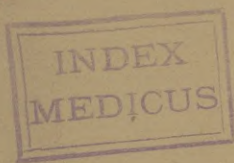


ESKRIDGE (J. T.)



ATAXIA.

CLINICAL LECTURE DELIVERED AT THE ARAPAHOE COUNTY HOSPITAL,
DENVER, COLORADO.

BY J. T. ESKRIDGE, M.D.,

Formerly Post-Graduate Instructor in Nervous Diseases in the Jefferson Medical
College, and Physician to the Hospital of the College; President of the
Colorado State Medical Society; Neurologist to the Arapahoe
County, St. Luke's, and Deaconess Hospitals.

[REPRINTED FROM INTERNATIONAL CLINICS, JANUARY, 1892.]



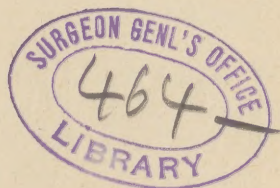
ATAXIA.

CLINICAL LECTURE DELIVERED AT THE ARAPAHOE COUNTY HOSPITAL,
DENVER, COLORADO.

BY J. T. ESKRIDGE, M.D.,

Formerly Post-Graduate Instructor in Nervous Diseases in the Jefferson Medical
College, and Physician to the Hospital of the College; President of the
Colorado State Medical Society; Neurologist to the Arapahoe
County, St. Luke's, and Deaconess Hospitals.

[REPRINTED FROM INTERNATIONAL CLINICS, JANUARY, 1892.]



ATAXIA.

CLINICAL LECTURE DELIVERED AT THE ARAPAHOE COUNTY HOSPITAL, DENVER,
COLORADO.

BY J. T. ESKRIDGE, M.D.,

Formerly Post-Graduate Instructor in Nervous Diseases in the Jefferson Medical College, and Physician to the Hospital of the College; President of the Colorado State Medical Society; Neurologist to the Arapahoe County, St. Luke's, and Deaconess Hospitals.

GENTLEMEN,—I wish to call your attention to-day to a series of cases, the prominent symptom of all of which is a condition of incoördination or ataxia. Whilst one symptom is rarely of sufficient importance to enable the clinician to base his diagnosis upon it, yet some have such especial value that we rarely care to make a positive diagnosis of certain diseases unless they are present. So great stress has been laid upon a few symptoms in the study of neurological cases as indicating certain definite diseased conditions, that the student often makes the mistake, when he finds one of them present in a given case, of making a definite diagnosis of the disease in which this symptom is usually most prominent and of greatest diagnostic value. He often forgets that, no matter how great a diagnostic value a symptom of a certain diseased condition of the nervous system may have, its presence is not infrequent in affections other than those with which it is usually prominently associated.

The cases which I wish now to discuss with you will illustrate these points.

The first case is a form of spinal trouble in which, if typical and advanced beyond the early stage, ataxia is never absent. In exceptional cases of the kind to which I am about to direct your attention the legs may be free from ataxia and the arms or chest-muscles affected, and in the very early stage of the disease ataxia is not a prominent symptom, and, indeed, may be entirely absent.

POSTERIOR SPINAL SCLEROSIS.

CASE I.—H. L., male, aged forty-three, born in New York, miner and prospector, was admitted to the hospital complaining of staggering gait and pains shooting down the legs. Further than that his mother died of cancer in the breast, he knows but little of his family history. In youth, he says, he was quite healthy. He came to Colorado about fourteen years ago, and at about this time began to live irregularly, drinking to excess when opportunity permitted, and indulging in venery whenever he left the camp and came to town. He makes the statement that for periods of weeks he indulged in sexual intercourse as often as four or five times each night. Ten years ago he contracted a hard chancre, which was not followed by secondary symptoms. Nine years ago he noticed shooting pains in the region of the right shoulder-blade. After a few months, pains similar in character were also felt in the left shoulder-blade, and soon extended to the arms, and occasionally were felt in the legs. During the first two or three years after the beginning of the shoulder pains, the darting pains in the limbs were felt only during changes of weather, and were always relieved by a resort to the hot springs of Arkansas. During these years, after doing severe work he would notice a constricted feeling around the abdomen on a level with the upper lumbar region. About six years ago he noticed an unsteadiness in his gait, increased by darkness or closure of his eyes. At about this time pains became quite severe in his legs, and, shortly after, vision in the right eye was observed to be poor. Ataxic gait and shooting pains steadily increased. The pains were at first of short duration, moderate in severity, and comparatively infrequent in their recurrence except when changes of weather were well marked. Pain would at times not be felt for months. As the disease progressed, the exacerbations of pain recurred weekly or monthly, would last for hours and days at a time, and caused acute suffering, and other symptoms, some of which were probably present before, were noticed by him. Among these were loss of sensation in different portions of the body, burning in the skin, inability to tell the position of his limbs when his eyes were closed, constipation, difficulty in voiding his water, dizziness, causeless attacks of nausea and vomiting, blurred vision, and a sense of prostration or weakness. During the last eighteen months he has been unable to walk without the assistance of crutches, on account of weakness and an uncertainty of his gait.

When he entered the hospital, a few months ago, his symptoms differed but little from those which he now exhibits. His gait is un-

steady and decidedly ataxic, and he walks mincingly, with feet wide apart. One peculiarity in his gait, as you will observe, is that he makes undue muscular effort in endeavoring to place one foot before the other, while the foot is raised too high and comes down on the floor with a thud, the heel striking first, or the whole plantar surface of the foot coming in contact with the ground at the same time. Muscular effort in walking seems to be sufficient for long strides; but you see he only projects one foot ahead of the other a few inches at each attempt to step. His steps are short, on account of the great amount of ataxia present. His eyes are kept constantly fixed on the floor, and his feet wide apart, with one crutch on the floor, in his endeavor to stand. He says he cannot feel the unevenness of the floor when walking on bare feet. If I ask him to close his eyes he is totally unable to support himself in the erect posture assisted by his crutches. While he is sitting you observe great ataxia of the legs and arms on his attempting to make any definite movements with them. If he endeavors to sit up in bed with eyes closed, there is a constant movement of the body on account of the ataxic condition of the trunk-muscles. The knee-jerks are completely absent; there is no ankle-clonus; there are slight cremasteric reflexes, especially on the left side. The abdominal reflexes are well marked; the deep reflexes of the forearms greatly exaggerated, though but little altered in the upper arms. The iritic reflexes are absent to light, but present to accommodation. The tongue is protruded in the median line. The right hand registers with the dynamometer 130; the left, 90.

The tactile sense is perfect in the face and upper portion of the chest. In the right hand two points are only recognized as such on the end of the thumb when held five-sixteenths of an inch apart, and on the ends of the fingers when separated from one-fourth to one-eighth of an inch. Besides the inability to recognize two points as such at the normal distance on the ends of the fingers of this hand, there is an indefiniteness of the sense of touch, two points sometimes feeling like three or more. Tactile sense is nearly normal in the left hand. The sense of touch is abolished in spots on the right arm; slightly perverted in areas on the left. The contact of a substance on the front of the left ankle is interpreted by him as being on the front of the right ankle, and on the front of the right ankle is either not perceived or is referred to as being near the heel of the same foot. An object brought in contact with the left instep is felt on the right leg. The same perversion of the sense of touch extends throughout the legs and lower parts of the body.

The temperature-sense is greatly changed on the legs and lower portions of the body. Cold substances are recognized as hot in some places and are not perceived in others. Bottles containing water of about the same temperature as the body are not felt at all, while those of a temperature of 150° F. give rise to intense pain in some places and to no sensation in others. The pain-sense is lessened in some places and abolished in others, and everywhere over the legs and lower portions of the body it is greatly delayed. In some places the delay is as much as fifteen seconds. In places where he is unable to recognize slight contact of substances, firm pressure is felt. Muscular sense is entirely abolished in the lower extremities. Hearing, taste, and smell are well preserved, and equally so on the two sides.

Vision: R. E., $\frac{20}{100}$; L. E., $\frac{20}{20}$. The fields are only slightly contracted; there is bluish-gray atrophy of the optic disks, more marked in the right eye than in the left.

He suffers a great deal from paroxysms of sharp shooting pains in the legs, and, less severely, in the arms. These sometimes occur daily, lasting only an hour, and at other times only once a week, when they last from ten to twelve hours.

Since his admission to the hospital his pains have been at times so severe that it has been necessary to give large doses of morphine hypodermically; but the unpleasant effects of these in his case make him more willing to endure the pain from the effects of the disease than the suffering caused by the morphine. At one time, when only one-half grain was given, the symptoms caused by it were really alarming. His breathing became slow and labored; he felt extremely prostrated, and experienced a sense of impending death; his temperature went up to 102.5°. He remained in this condition of agony for a period of forty-eight hours; then followed two or three days of nausea, vomiting, complete anorexia, and great weakness. During the first twenty-four hours after administering the morphine his skin was dark and his lips blue and livid. I have noticed in one other case of posterior spinal sclerosis, in which I had reason to suspect that the disease had extended into the medulla, marked intolerance of the respiratory apparatus to the use of morphine.

The chief diagnostic symptoms of posterior spinal sclerosis are found in the history of this case. The three symptoms of the greatest value, both on account of their appearance early in the disease and the infrequency of their absence, are loss of the knee-jerk and iritic reflex, and the presence of shooting or lightning-like pains, especially prominent in the legs, but sometimes, as in the present case, appearing first

in the shoulders and arms. Their usual character is sufficiently clearly illustrated in this case. Which of the three symptoms is the earliest to appear depends, in all probability, upon the region of the central nervous system first attacked.

The absence of the reflex contraction of the iris to light is very suspicious of posterior spinal sclerosis if the movements of the pupils on looking at very near objects still remain; especially if local disease of the iris—such as iritis with adhesions—and a form of insanity known as parietic dementia (a few cases of which you have had an opportunity of seeing during the early winter) have been excluded.

The pupils in posterior sclerosis are usually small, and neither dilate on the patient's going into a dark room, nor contract when the eyes are exposed to a bright light, provided in the last instance the patient is requested to keep his eyes fixed on some object not less than twenty feet distant. This is known as the Argyll-Robertson pupil, named in honor of the physician who first described it. Loss of the knee-jerk occurs in these cases before ataxia becomes apparent. It is usually conceded that it requires a greater break in the reflex arc to produce ataxic symptoms than to abolish the knee-jerks. Given a case in which is found a history extending over months of apparently causeless sharp shooting pains ("rheumatic pains"), with loss of the knee-jerk and the iritic reflex, a positive diagnosis of posterior spinal sclerosis is usually safe, provided errors in testing for these symptoms are excluded.

Ataxia is well marked in the case before you, as it is in most cases of advanced posterior spinal sclerosis. This symptom of itself is of great value, not so much on account of its importance as an aid in making an early diagnosis, as its significance in pointing to some organic lesion of the nervous system. You will see, as we study the other cases which I intend to bring before you to-day, that it is a pronounced symptom in quite a number of nervous lesions. The exaggerated condition of the deep reflexes in the forearms indicates lateral sclerosis of the upper portion of the cord combined with posterior sclerosis in this region.

The sensory disturbances are numerous and interesting in this case, but we must pass on to the study of another form of spinal-cord trouble in which ataxia is prominent.

TRANSVERSE MYELITIS, BEGINNING UNILATERALLY.

CASE II.—F. R., male, aged twenty-nine, born in Germany, family history unimportant, was admitted to the Arapahoe County Hospital

complaining of general debility. He denied syphilis and alcoholic indulgence. The resident physician who admitted him observed an ataxic condition of his gait, and without further examination diagnosed his condition posterior sclerosis of the spinal cord, and so reported the case to me. The man was sent to the hospital for what was diagnosed as neurasthenia. On investigating his case I found that it presented interesting features, a state of affairs quite different from either of the above diagnoses. He had been well up to about two years before his admission to the hospital. At that time, while laboring in a brewery, doing heavy work at shovelling, he began to suffer with pain in the left side extending from the spine around to the sternum, on a level with about the ninth, tenth, and eleventh ribs. He says that the parts at the time were sensitive and swollen. Soon after this he had cramps in the muscles of the right arm, but none in the leg. Shortly after this he noticed that his right arm and leg were becoming weak. The pain in the left side continued to be quite severe, and at times was sharp and lancinating.

On examination we find that he stands with his feet wide apart and is unable to maintain an erect posture when his eyes are closed. His gait is awkward and ataxic, but differs considerably from that seen in persons suffering from posterior sclerosis of the cord. The right leg seems to be considerably weaker than the left. The right foot is not raised high from the ground in walking, and there is a tendency to foot-drop on this side. When he attempts to walk with his eyes closed, he immediately begins to stagger, and would fall if not supported. With his eyes open it is impossible for him to stand on either foot. The same ataxic condition is manifested in the arms. While the right leg is weaker than the left, there is not complete paralysis of any group of muscles. The right knee-jerk is enormously exaggerated; the left slightly increased over the normal. Ankle-clonus is well developed on the right side, but absent on the left. The plantar reflexes are almost completely abolished on the right side; present, but diminished, on the left. The cremasteric and abdominal reflexes are absent. The deep reflexes in the right arm are considerably increased, and those in the left slightly so. The dynamometer indicates with the right hand 24 and with the left 94. The electro-muscular contractility in the arms is normal, nearly normal and equal in the two thighs, and decidedly impaired below the right knee. The action of the iris to light and accommodation is good.

There is no complaint of shooting pains in the arms or legs, the only pain he complains of being in the lower costal region on the left

side. The tactile sense is normal in the left hand, but impaired in the right, for, although he recognizes two points as such, it is only at about four times the normal distance. There is slight impairment of the sense of touch in the right toes, and loss of it along a narrow strip on the outer side of the right leg below the knee. Apparently no deviation from the normal sense of touch exists in any other portion of this leg or in the left leg. Tactile sense is about normal on the left side of the trunk, but somewhat impaired on the right. Temperature-sense throughout the body is normal. Pain-sense is nearly normal throughout the trunk and limbs, except in the lower costal region on both sides, where it is slightly lessened. Sight, hearing, smell, and taste are preserved, and are equal on both sides. On examination of the spinal column, I find considerable deformity in the lower costal region opposite the eleventh spine, over which there is considerable depression. The spinal column projects forward at this point. Pressure in this region gives rise to considerable pain, felt in the chest opposite this point on both sides, but more on the left.

We have here, then, caries of the body of the eleventh costal vertebra, the posterior portion of which has given way more rapidly than the anterior, and allowed the posterior portion of the bodies of the tenth and eleventh costal vertebræ to approach each other nearer at this point than at the anterior surfaces, giving rise to a condition of anterior spinal curvature. Two years ago he first felt pain in this region of the spine. An inflammatory condition of the bone had been set up by the character of his work, which required heavy lifting in a stooping posture. As a result of the inflammatory condition of the bone we have had superinduced an inflammatory thickening of the dura, and, as a result, pressure upon the cord itself. From the history of the symptoms early in the case, we judge that the trouble in the cord was at first a unilateral transverse myelitis of the right side. As the case progressed, other portions of the cord became affected, and the present examination shows that both its right and left halves are implicated in the destructive process.

You see, then, how misleading it would be to make a diagnosis of a given condition because a prominent symptom of such is present. In many cases of disease of the cord, an accurate diagnosis can be made only after a thorough examination of all the symptoms, together with a detailed history of the case. Had this case not been mistaken by the physician in attendance early in the disease, it might have been permanently cured by counter-irritation with the actual cautery applied over the diseased bone, and by rest in the recumbent posture until all

inflammatory trouble had subsided ; after which a plaster jacket, skilfully applied and worn for a year or two, and changed from time to time as the necessity of the case demanded, would have been all that was necessary in the way of treatment for a complete restoration of function. As we find the condition now, a complete cure is impossible. Portions of the cord are diseased irretrievably, and, no matter what treatment we adopt, the functions of the cord will be impaired. The most that we can hope to accomplish in this case is to arrest the progress of the bone-trouble and lessen pressure on the cord. This can be accomplished only by rest for many months in bed in the recumbent posture. The man must not be allowed to get up to obey the calls of nature, neither will he be allowed to assume a half-reclining posture to eat or read. At the same time, counter-irritation by means of the actual cautery is indispensable. Probably at the end of a few months, if the inflammatory condition of the bone subsides, he may be allowed to get up and walk around with a plaster jacket on. In the way of direct medication but little can be accomplished in this case. Probably small doses of potassium iodide offer us the best results in removing the exudate on the dura, but all the thickening will never be got rid of, and in consequence he stands in great danger of a progressive chronic myelitis.

The detailed symptoms of this case, in which ataxia is a prominent symptom, make quite a different clinical picture from that found in Case I.

An early diagnosis of caries of the spine is so important that you should be familiar with the principal symptoms of the disease, and never fail carefully to examine for it in all obscure cases presenting irregular nervous symptoms. Pain on pressure is located in one portion of the spine, and is usually limited to one spinous process, and at most to three. The radiating pain caused by the pressure starts from a point on a level with the tender or painful portion of the spine.

We found in studying the early diagnostic symptoms of posterior spinal sclerosis that the loss of the knee-jerk and the iritic reflex and the presence of shooting pains were of sufficient importance to make the diagnosis of this disease positive. In the case that is before you, the knee-jerks are greatly exaggerated, the iritic reflexes are normal, and the pains complained of are different in character from those found in the first case. The pain is constant and localized, and, when severe, is never so diffuse as it is in posterior spinal sclerosis. The other sensory symptoms, also, are quite different from what we found them to be in the latter disease.

It was the extreme prominence of the ataxic symptoms in this case which led the resident physician to conclude that it was one of posterior spinal sclerosis. It is the presence of a combination of symptoms, and not the prominence of an isolated one, which is to be relied upon in making a diagnosis of any special disease.

AN IRREGULAR CASE OF POSTERO-LATERAL SCLEROSIS.

CASE III.—B. F., male, aged forty-nine, American, by occupation a carpenter, entered the hospital complaining of a difficulty in walking. His family history is unimportant. He denies alcoholism and any venereal trouble. If we may credit his statement (and he seems like a man on whose judgment we may rely), he had enjoyed uninterrupted good health until about five years ago, when he contracted small-pox. He seems to have been quite sick with the disease, which lasted about twenty-one days, and which was attended during part of its course (which part he is not able to tell us) by considerable headache, restlessness, delirium, and unconsciousness, lasting about a week. At the end of the acute illness he found himself dumb and blind, and unable to walk without assistance. He says the lack of motion did not seem so much from weakness as from an inability to manage, or co-ordinate, his muscles. With the exception of sight, all the special senses were unaffected. About two months after the acute illness had abated, his sight began to improve, and the power of speech was slowly returning. During the subsequent five years, the period from the time of the beginning of his trouble to the present, he states that his vision has decidedly improved, so that now he is able to read with glasses. The power of speech has not completely returned, as it still retains a slight nasal twang. He informs me that locomotion has grown decidedly worse, so that now it is impossible for him to walk without assistance. One curious fact in his case is that during this entire period of five years he has not experienced the slightest sensory disturbances of any kind.

Examination shows that he is able to rise to his feet without assistance, but unable to maintain the erect posture unless the feet are placed wide apart, and then only for a few minutes. When the eyes are closed it is impossible for him to stand, even assisted with one or both canes, for more than a few seconds at a time. If he attempts to place the feet near together, even with the eyes open, swaying of the body begins, and he manifests great incoördinate action in trying to prevent himself from falling. While walking there is a slight spastic contraction of the flexor muscles of the legs. The ball of the foot first comes in con-

tact with the floor, and, as the contracted muscles are slow to yield, it is a few seconds before he can bring the heel to the floor, thus making locomotion not only extremely difficult but exceedingly slow. You observe that his gait is quite different from that seen in our patient suffering from posterior sclerosis of the cord. In the latter the feet were raised high at each step, while this man almost drags his and pushes them forward with effort.

On examining the muscular strength, I find it is well maintained. The inability to walk properly is due to two causes, ataxia and a slight spastic condition of the muscles (the ataxic paraplegia of Gowers). Incoördinate movements are found in the arms, but to a less extent than in the legs. The dynamometer registers 84 with the right hand and 98 with the left. The right knee-jerk is greatly exaggerated; the left exaggerated, but to a less extent. There is no ankle-clonus. The deep reflexes of the forearms are slightly increased. The superficial reflexes all over the body and limbs are well preserved. He experiences neither numbness nor other perversion of sensation in any portion of the body. There is no affection of hearing, taste, or smell. The electrical reaction of the muscles is normal. The muscles maintain their nutrition fairly well, especially when we consider that the patient walks but little, on account of the extreme degree of the ataxic condition.

Ataxia and a slight spastic condition of the muscles are the only symptoms of any prominence in the present case. Absence of muscular atrophy and the presence of tactile, pain-, and temperature-senses enable us to exclude the anterior cornua, the antero-lateral ascending tracts, and probably the postero-external columns of the cord, from the regions involved. When the postero-external columns (the root zones) are affected by a chronic degenerative process, shooting pains form a prominent symptom, on account of the pain-conducting fibres being damaged on their passage through these columns to reach other portions of the cord. The absence of pain in the present case shows that at least that portion of the postero-external column through which the fibres conducting pain-sense pass to the pain-conducting paths of the cord (probably the antero-lateral ascending tracts of Gowers) has escaped the diseased process.

How can we explain the one prominent symptom, ataxia, in this case? We know that we are aided in muscular coördination by vision and tactile sense. In this case vision is good and the cutaneous sensibility normal, and yet there is marked ataxia. Brown-Séquard was the first to demonstrate that the fibres in the cord which conduct mus-

cular sense do not decussate. The fibres in the postero-median column pass up to the cerebellum by means of the post-pyramidal nucleus without decussating, and probably are always diseased in posterior spinal sclerosis when ataxia of the legs is present. We may infer, then, that the postero-median columns are diseased in the patient who is now before you. The lateral or pyramidal tracts are also affected to a slight degree. Whether the degenerative process is primary or secondary we shall discuss in a few minutes.

There are some interesting features in the history of the present case. We know that degeneration in the posterior and lateral columns of the cord usually takes place slowly, and that the symptoms come on gradually. The patient tells us, and he has reiterated it to me several times on my questioning him in regard to the onset of his ataxia, that he was enjoying excellent health until five years ago, when he was attacked by small-pox. He was quite ill for three weeks, and at the end of this time he was nearly blind, could scarcely speak so as to make himself understood, and found great difficulty in walking, owing to his inability to coördinate his muscles. On examining his eyes carefully I find no evidence of a former keratitis to account for loss of vision at the time of his acute illness. If his loss of vision had been due to small-pox affecting the corneæ, some cloudiness would still remain. The optic disks show evidences of an old inflammatory trouble, although vision is now fairly good. The only conclusion at which I am able to arrive is that the patient had cerebro-spinal (spotted) fever instead of small-pox, and that the eruption of the former was mistaken by his physician for that of the latter. Accepting the theory that he suffered from cerebro-spinal fever which resulted in inflammatory deposits along certain nerves of the medulla and at the base of the brain, and along the medulla itself, we can readily understand how so chronic a disease as the one before us may have had an acute or subacute beginning. In other words, we have not a posterior spinal sclerosis of the primary form, but one secondary to focal irritation, and this accounts for certain irregularity of symptoms.

MULTIPLE NEURITIS.

CASE IV.—J. R., male, aged fifty-three, a Hungarian rag-picker, with inability to speak the English language, sought admission to the hospital on account of great weakness in his limbs. He denied indulgence in alcohol and venereal excesses. There was no specific history. He stated that he felt well and strong until about four weeks previous to his admission to the hospital, when he contracted a cold and suffered

with swollen tonsils and slight soreness of the throat. You must remember that up to the time of his illness and for several years past he has been engaged in rag-picking and been supported on a scanty diet. One week after the beginning of his throat trouble he began to experience a numb, dead sensation in the feet and legs up to the knees. A burning sensation in the feet, especially on the plantar surfaces, was particularly well marked, as was also a band-like sensation around the ankle. At about the same time similar sensory disturbances were experienced in the hands and arms below the elbows. Muscular weakness of the arms below the elbows and of the legs below the knees, especially involving extensor groups, soon followed the subjective sensory disturbances. These symptoms in the arms and legs increased until his admission to the hospital, when it was with great difficulty that he was able to walk or stand.

When examined, two days subsequent to admission, his gait was found to be unsteady and ataxic. It was with great difficulty that he was able to stand with the eyes open, notwithstanding the feet were widely separated, and with the eyes closed it was impossible for him to maintain the erect posture without assistance. He was unable to walk backwards even with the eyes open. The knee-jerks were absent. The plantar sensibility was acute and painful. Stroking the plantar surfaces of the feet with the ends of my fingers caused him to experience considerable burning pain in them, and occasioned smart reflex contraction of the thigh-muscles. The plantar reflex proper seemed to be lessened, only a sense of intense burning pain following the stroking. The cremasteric reflexes were absent on the right side, present on the left. The superficial reflexes of the abdomen were present. The arms were decidedly ataxic in their movements. The deep reflexes in the arms were absent below the elbows, but present and nearly normal above. The dynamometer registered 0 in either hand. The vision in the right eye was normal, the fundus healthy, and the fields well preserved. The reflexes of the iris were present. The left eye had been enucleated. Muscular power was fairly well preserved in the shoulders and upper arms, but nearly gone below the elbows, and a slight tendency to wrist-drop existed. Muscular power above the knees was fairly well preserved, but below was exceedingly slight. There was no marked tendency to foot-drop, but a complete dorsal flexion of the feet was almost impossible. The patient complained of a burning sensation, as of fire, in the plantar and palmar surfaces, of a band-like sensation around the wrists and ankles, and of a crawling sensation, like that produced by worms crawling on the body, in the

legs up to the knees, and in the arms below the elbows. He stated that if it were not for the pain and unpleasant sensations below the knees and elbows he would feel as though these portions of the limbs belonged to some one else. The sense of touch below the knees, and in the arms from a few inches below the elbows down, was entirely abolished. Pain- and temperature-sense were present, though somewhat perverted, in the legs, feet, hands, and arms of both sides. He said that he experienced a sensation as though in his palms there were hot blisters filled with cushions of air. The temperature-sense, especially to cold, was very acute in his hands. There was no affection of the bowels or bladder. There had been but slight muscular wasting. The muscles of the legs and arms responded to the faradic current imperfectly. Taste, smell, and hearing were normal. There was no affection of the heart or of the respiratory muscles. The urine was free from albumin and sugar.

The treatment consisted in keeping the surface of the body warm (this was accomplished by wrapping him in blankets and applying hot fomentations to the legs and arms), administering salicylate of sodium and strychnine, the employment of gentle massage, and, later, in the application of electricity.

For two months after his admission to the hospital he grew steadily worse, and at the end of that time he was not able to move a finger or toe. All the muscles below the knees and elbows were completely paralyzed. Marked wasting had taken place. Contractures, especially in the muscles of the hands, were well marked. Loss of sensation had extended nearly up to the hips, and slightly above the elbows, but the vital centres were in no way affected.

He has been in the hospital now about three months, and improvement during the last three or four weeks has been steady and uninterrupted.

There is some doubt as to the cause of the multiple neuritis in this case. The history of a cold in the throat with enlargement of the tonsils preceding the attack a week or more points to diphtheria as the cause, but there has been apparently no affection of the palate and ciliary muscles, as has been invariably the rule in all undoubted cases of diphtheritic paralysis which have come under my observation. Besides, the pain in the legs and arms, and especially in the palms and soles, has been much more severe than I have ever found it in diphtheritic paralysis. I am inclined to regard the throat trouble as an accidental coincidence and of little importance. It served for him, as trivial ailments do for most ignorant persons, as a cause to which to

attribute his disease. In the absence of a more tangible cause, I am inclined to attribute the neuritis to poor nutrition and exposure, probably a starvation neuritis.

The diagnosis of multiple neuritis is important, and, in the majority of cases, comparatively easy. In all well-marked acute cases the motor and sensory symptoms, limited, as a rule, to the distal portions of the extremities, and most pronounced in the hands and feet, the sensitive condition of the nerves to pressure, the band-like sensation around ankles and wrists, the blunted, and finally abolished, sense of touch, the muscular weakness, and loss of knee-jerk, are sufficiently characteristic of the nature of the disease. Acute polio-myelitis, acute ascending paralysis, and posterior spinal sclerosis might, without due care, be confounded with it. I am unable at present, on account of lack of time, to go into an extended differential diagnosis between these diseases. In all uncomplicated cases of acute polio-myelitis there are no sensory symptoms. Posterior spinal sclerosis is always chronic. Acute ascending paralysis always affects the legs and trunk before the arms become involved.

[This patient, at the end of five months, was able to leave his bed and walk about with the assistance of crutches, and at the end of another month he had so completely recovered as to be able to return to his work.]

I have not exhausted the list of diseases of the nervous system in which ataxia is found. I have recently seen two cases of tumor of the cerebellum in which there was a condition known as cerebellar ataxia or titubation. It differs from the ataxia seen in posterior spinal sclerosis in that the legs are not moved as irregularly, and the gait is more like that seen in a staggering drunken person. Both these patients experienced a sensation of falling, or of being about to fall, whenever they attempted to walk. In each of the cases just referred to the autopsy showed that the tumor involved the middle lobe of the cerebellum. It is claimed that in tumors of the lateral lobes of the cerebellum not sufficiently large to exert pressure on the middle lobe the gait is unaffected.

Tumors in other regions of the brain, especially those involving the septum lucidum and the membranes over the anterior lobes, give rise to irregular jerky movements, which in the cases that I have seen—and two such died in the hospital last summer—were more marked in the arms than in the legs, the latter manifesting their muscular disturbance more by an irregular jerky tremor.

There is an ataxic condition which is hereditary, known as Fried-

reich's disease, but of this I shall have nothing further to say at this time.

I hope I have impressed upon your minds by the cases which we have studied to-day the fact that ataxia is not a disease, but often a very prominent and important symptom of many diseases of the nervous system. You should know the significance of such a symptom as ataxia; but this is not sufficient, you must also know its diagnostic value when associated with various groups of symptoms. After all, it is the ability to appreciate peculiar combinations of symptoms that enables one to become expert in diagnosis.

